

WATER SOURCEBOOK

A Series of Classroom Activities for
Grades 6-8

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GLOSSARY

- abandoned well:** any well (drinking water, oil and gas, etc.) which is not used for a long period of time, is not maintained properly, and/or is not properly sealed when its useful life is over.
- acidity:** the strength (concentration of hydrogen $[H^+]$ ions) of an acidic substance; measured as pH.
- acid rain (or acid precipitation):** rain with a pH of less than 5.6; results from atmospheric moisture mixing with sulphur and nitrogen oxides emitted from burning fossil fuels or from volcanic activity; may cause damage to buildings, monuments, car finishes, crops, forests, wildlife habitats, and aquatic life.
- The Act to Prevent Pollution From Ships:** legislation regulating the discharge of oil, noxious liquid substances, or garbage generated during normal operations of vessels.
- adhesion:** force of attraction between two unlike materials.
- aeration:** the process of exposing to circulating air.
- aerial photography:** high altitude pictures taken from an aircraft or satellite.
- aerobic:** living or occurring in the presence of oxygen.
- agricultural sewage:** waste produced through the agricultural processes of cultivating the soil, producing crops, or raising livestock..
- agriculture:** the science, art, and business of cultivating the soil, producing crops, and raising livestock; farming.
- airborne pollutants:** contaminants borne by air that cause harm to human health or the environment.
- algae:** any of a large group of simple plants that contain chlorophyll; are not divisible into roots, stems and leaves; do not produce seeds; and include the seaweeds and related freshwater and land plants.
- algal bloom:** a heavy growth of algae in and on a body of water; usually results from high nitrate and phosphate concentrations entering water bodies from farm fertilizers and detergents; phosphates also occur naturally under certain conditions.
- alternative:** a chance to choose between two or more possibilities; one of the two or more possible choices.
- alum:** as used in drinking water treatment, aluminum sulfate; added to water in drinking water treatment facilities to cause dirt and other particles to clump together and fall to the bottom of settling basins.
- amendments:** revisions or changes (as to laws).
- anaerobic bacteria:** any bacteria that can survive in the complete or partial absence of air.
- Aqua Lung:** a trademark for a self-contained underwater breathing apparatus (scuba).
- aquacade:** an entertainment spectacle of swimmers and divers, often performing in unison to the accompaniment of music.
- aquaculture:** the science, art, and business of cultivating marine or freshwater food fish or shellfish, such as oysters, clams, salmon, and trout, under controlled conditions.

aquamarine: a transparent blue-green variety of beryl, used as a gemstone.

aquanaut: a person trained to live in underwater installations and conduct, assist in, or be a subject of scientific research.

aquaplane: a board on which one rides in a standing position while it is pulled over the water by a motorboat.

aquarelle: a drawing done in transparent water colors.

aquarist: one who maintains an aquarium.

aquarium: a tank, bowl, or other water-filled enclosure in which living aquatic animals and, often, plants are kept.

Aquarius: a constellation in the equatorial region of the Southern Hemisphere near Pisces and Aquila.

aquatic life: plants, animals, and microorganisms that spend all or part of their lives in water.

aqueduct: a conduit designed to transport water from a remote source, usually by gravity.

aquifer: an underground layer of unconsolidated rock or soil that is saturated with usable amounts of water (a zone of saturation).

Army Corps of Engineers: Branch of the U.S. Army; responsible for maintaining and regulating inland waterways.

artesian well: a well in which the water comes from a confined aquifer and is under pressure. One type of artesian well is a **free-flowing artesian well** where water just flows or bubbles out of ground without being pumped.

atmospheric transport: the movement of air pollutants from one region to another by wind; may be hundreds of miles.

autotroph: an organism that can make its own food (usually using sunlight).

bacteria: Bacteria are single-cell microbes that grow in nearly every environment on Earth. They are used to study diseases and produce antibiotics, to ferment foods, to make chemical solvents, and in many other applications.

bacterial water pollution: the introduction of unwanted bacteria into a water body.

bag limit: the number of a certain fish that can be caught each day.

bay: a large estuarine system (Example: Chesapeake Bay).

benthic zone: the lower region of a body of water including the bottom.

biocontrol agent: an organism used to control pests Example: lady bugs used to control aphids in a garden).

biodegradable: capable of being decomposed (broken down) by natural biological processes.

biological diversity: a wide variety of plant and animal life.

bioremediation: the use of oil-eating organisms such as bacteria and fungi to remove pollutants.

biosolids: solid materials resulting from wastewater treatment that meet government criteria for beneficial use, such as for fertilizer.

bivalve: a mollusk that has two shells hinged together, such as the oyster, clam, or mussel.

blackwater: domestic wastewater containing human wastes.

blue baby syndrome: a pathological condition, called methemoglobinemia, in which blood's capacity for oxygen transport is reduced, resulting in bluish skin discoloration in infants; ingestion of water contaminated with nitrates or certain other substances is a cause.

bog: a poorly drained freshwater wetland that is characterized by a build-up of peat.

bottom lands: low-lying land along a waterway.

brine: water saturated with or containing large amounts of a salt, especially of sodium chloride.

calcium carbonate: a powder occurring in nature in various forms, as calcite, chalk, and limestone, which is used in polishes and the manufacture of lime and cement.

carcinogenic: describing a substance that tends to produce cancer.

catch basin: a sedimentation area designed to remove pollutants from runoff before being discharged into a stream or pond.

caution: a warning against danger.

centrifugal force: the force that causes something to move outward from the center of rotation.

cesspool: a covered hole or pit for receiving untreated sewage.

channelization: the process of channeling or carving a route.

chemical: related to the science of chemistry; a substance characterized by a definite chemical molecular composition.

chemical pollution: introduction of chemical contaminants into a water body.

chlorination: water disinfection by chlorine gas or hypochlorite.

chlorine: a chemical element, symbol Cl, atomic number 17, atomic weight 35.453; used as a disinfectant in drinking and wastewater treatment processes.

cholera: an acute, often fatal, infectious epidemic disease caused by the microorganism *Vibrio comma*, that is characterized by watery diarrhea, vomiting, cramps, suppression of urine, and collapse.

Clean Water Act: water pollution control laws based upon the Federal Water Pollution Control Act of 1972 with amendments passed in 1977, 1981, and 1987; main objective is to restore and maintain the "chemical, physical, and biological integrity of the Nation's waters."

closed season: a time when a certain fish cannot be caught.

closed system: a system that functions without any materials or processes beyond those it contains and/or produces itself.

cloud: a visible mass of tiny bits of water or ice hanging in the air, usually high above the earth.

cohesion: the force of attraction between two like materials.

coliforms: bacteria found in the intestinal tract of warm-blooded animals; used as indicators of fecal contamination in water.

communities: related groups of plants and animals living in specific regions under relatively similar conditions.

compost: an aerobic mixture of decaying organic matter, such as leaves and manure, used as fertilizer.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund): legislation passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA); provides for short-term actions called removal actions in response to accidents and improper handling of hazardous materials which pose an immediate threat to human health and safety. It also provides for long-term actions called remedial actions for cleanups of other sites which pose no immediate threat to public safety.

condensation: the act or process of reducing a gas or vapor to a liquid or solid state.

cone of depression: the cone-shaped area formed when the spaces in the rock or soil are emptied as water is withdrawn from a well.

confined aquifer (artesian aquifer): an aquifer with a dense layer of compacted earth material over it that blocks easy passage of water.

conservation: act of using the resources only when needed for the purpose of protecting from waste or loss of resources.

conservation farming: the management of farm activities and structures to eliminate or reduce adverse environmental effects of pollutants and conserve soil, water, plant, and animal resources.

conserve: to save a natural resource, such as water, through intelligent management and use.

constructed wetlands: wetlands that are designed and built similar to natural wetlands; some are used to treat wastewater. Constructed wetlands for wastewater treatment consist of one or more shallow depressions or cells built into the ground with level bottoms so that the flow of water can be controlled within the cells and from cell to cell. Roots and stems of the wetland plants form a dense mat where biological and physical processes occur to treat the wastewater. Constructed wetlands are being used to treat domestic, agricultural, industrial, and mining wastewaters.

contaminant: an impurity, that causes air, soil, or water to be harmful to human health or the environment.

contaminate: to make impure (not pure) by contact or mixture; to introduce a substance into the air, water, or soil that reduces its usefulness to humans and other organisms in nature.

contamination: the state of being contaminated or impure (not pure) by contact or mixture; the state of having a substance introduced into the air, water, or soil that reduces its usefulness to humans and other organisms in nature.

contour plowing: a system of plowing along the contour lines of the land to prevent soil erosion.

convection current: the transfer of heat by the mass movement of heated particles.

cooling towers: a tower-like device in which atmospheric air circulates and cools warm water, generally by direct contact (evaporation).

corrosivity: ability to dissolve or break down certain substances, particularly metals.

"cradle to grave": phrase used to describe regulations that are part of the Resources Conservation and Recovery Act (RCRA), which requires that hazardous wastes be tracked from their points of origin to their proper disposal; these regulations are designed to protect groundwater, as well as other resources, from contamination by improper treatment, storage, and disposal of solid wastes and are aimed at ending irresponsible "midnight dumping."

crest: something forming the top of something else, such as the crest of a wave.

cubic feet: the volume of a cube whose edge is some number of feet in measure.

cubic meters: the volume of a cube whose edge is some number of meters in measure.

cumulative: increasing or enlarging by successive addition; acquired by or resulting from accumulation.

debris: dead organic material (leaves, twigs, etc.) and sediment.

decompose: to decay or rot; a result of microbial action.

decomposition: the process of rotting and decay which causes the complex organic materials in plants and animals to break down into simple inorganic elements which can be returned to the atmosphere and soil.

defecate: to void excrement or waste through the anus.

de-foaming agents: chemicals that are added to wastewater discharges to prevent the water from foaming when it is discharged into a receiving water body.

degradable: capable of decomposition; chemical or biological.

depression storage: the storage of water in low areas such as puddles, bogs, ponds, and wetlands.

desalination: the purification of salt or brackish water by removing the dissolved salts.

detergent: a synthetic cleansing agent resembling soap; has the ability to emulsify oil and remove dirt; contains surfactants that do not precipitate in hard water.

detritus: loose fragments or grains that have been worn away from rock.

digestion: decomposition of organic waste materials by the action of microbes; the process of sewage treatment by the decomposition of organic matter.

dilution: the act of making thinner or more liquid by adding to the mixture; the act of diminishing the strength, flavor, or brilliance of by adding to the mixture.

discharged: released into a water body.

disinfect (disinfected): to cleanse of harmful microorganisms.

disposal: a disposing of or getting rid of something, as in the disposal of waste material.

dissolved oxygen (DO): oxygen gas (O_2) dissolved in water.

dissolved solids: materials that enter a water body in a solid phase and dissolve in water.

distillation: the process of heating a liquid or solid until it sends off a gas or vapor and then cooling the gas or vapor until it becomes a liquid.

- distribution box:** a place where one pipe or line enters and exits through several pipes or lines; they are used in municipal drinking water systems to distribute water to homes, in municipal wastewater systems to retrieve wastewater, and by electric companies to distribute power.
- divining rod:** a forked branch or stick used in an attempt to locate subterranean water or minerals; it is said to bend downward when held over a source.
- domestic sewage:** waste produced through the functioning of a household.
- downstream:** in the direction of a stream's current.
- dowsing:** to use a divining rod in an attempt to find underground water or minerals.
- drainage basin:** an area drained by a main river and its tributaries.
- drainage system:** a network formed by a main river and its tributaries.
- drainfield:** the part of a septic system where the wastewater is released into the soil for absorption and filtration.
- dredging:** the cleaning, deepening, or widening of a waterway using a machine (dredge) that removes materials using a scoop or suction device.
- drought:** a lack of rain or water; a long period of dry weather.
- duck stamp:** required, for a fee, of all duck hunters over age 16 by the U.S. Fish and Wildlife Service; a conservation program aimed at preserving wetlands.
- ecology:** a branch of science concerned with the interrelationship of organisms and their environments; the totality or pattern of relations between organisms and their environment.
- ecosystem:** an ecological community together with its physical environment, considered as a unit.
- effluent:** waste material, such as water from sewage treatment or manufacturing plants, discharged into the environment.
- electroplating:** to coat or cover with a thin layer of metal using electricity.
- elements:** substances such as iron, sodium, carbon, nitrogen, and oxygen with distinctly different atoms which serve as some of the 108 basic building blocks of all matter.
- The Emergency Planning and Community Right-to-Know Act of 1986 (SARA Title III):** law requiring federal, state and local governments and industry which are involved in either emergency planning and/or reporting of hazardous chemicals to allow public access to information about the presence of hazardous chemicals in the community and releases of such substances into the environment.
- emission:** a substance discharged into the environment.
- endangered animal species:** a species of animal identified by official federal and/or state agencies as being faced with the danger of extinction.
- environment:** the sum of all external conditions and influences affecting the development and life of organisms.
- Environmental Protection Agency (EPA):** the U.S. agency responsible for efforts to control air and water pollution, radiation and pesticide hazards, ecological research, and solid waste disposal.

epidemic diseases: diseases that spread rapidly and extensively by infection among many individuals in an area.

erosion: the wearing away of the earth's surface by running water, wind, ice, or other geological agents; processes, including weathering, dissolution, abrasion, corrosion, and transportation, by which material is removed from the earth's surface.

estuarine: of an area where a river empties into an ocean; of a bay, influenced by the ocean tides, which has resulted in a mixture of salt water and fresh water.

estuarine intertidal emergents: herbaceous vegetation that grows in saltwater marshes.

estuarine intertidal forested/shrub: a saltwater wetland containing larger woody plants.

estuarine intertidal unconsolidated shores: beaches and sand bars.

estuarine subtidal: a habitat of open water and bay bottoms continuously covered by salt water.

estuarine unconsolidated bottom habitats: sandy bottom area in open water estuaries.

estuary: the area where a river empties into an ocean; a bay, influenced by the ocean tides, resulting in a mixture of salt water and fresh water.

eutrophic: pertaining to a lake containing a high concentration of dissolved nutrients; often shallow, with periods of oxygen deficiency.

eutrophication: a naturally occurring change that take place after a water body receives inputs of nutrients, mostly nitrates and phosphates, from erosion and runoff of surrounding lands; this process can be accelerated by human activities.

evaporate: to convert or change into a vapor with the application of heat.

evaporation: the act or process of converting or changing into a vapor with the application of heat.

evapotranspiration: combination of evaporation and transpiration of water into the atmosphere from living plants and soil.

Federal Water Pollution Control Act (Clean Water Act): the law to restore and maintain the "chemical, physical, and biological integrity of the Nation's waters."

feedlots: confined areas where livestock are quartered and fed, often these are holding areas where animals are fattened-up prior to being shipped to market.

fertilizer: any one of a large number of natural and synthetic materials, including manure and nitrogen, phosphorus, and potassium compounds, spread or worked into the soil to increase its fertility.

fill: material added to a wetland area to make it suitable for building.

filtration: the process of passing a liquid or gas through a porous article or mass (paper, membrane, sand, etc.) to separate out matter in suspension.

fish kill: the sudden death of fish due to the introduction of pollutants or the reduction of the dissolved oxygen concentration in a water body.

fishery: a place engaged in the occupation or industry of catching fish or taking seafood from bodies of water; a place where such an industry is conducted.

FL (fork length): the length of a fish from its mouth to the fork in its tail.

flocculation: the process of forming aggregated or compound masses of particles, such as a cloud or a precipitate.

flood conveyance: the transport of floodwaters downstream with minimal, if any, damage.

floodplain: a low, flat area on either side of a river that can accommodate large amounts of water during a flood, lessening flood damage further downstream.

flooding: an overflowing of water, especially over land not usually submerged.

fluoride: a binary compound of fluorine with another element; added to drinking water to help prevent tooth decay.

food chain: a succession of organisms in a community that constitute a feeding order in which food energy is transferred from one organism to another as each consumes a lower member and in turn is preyed upon by a higher member.

food web: the connections among everything organisms in a location eat and are in turn eaten by.

fossil fuel: a hydrocarbon fuel, such as petroleum, derived from living matter of a previous geologic time.

fresh water: water containing an insignificant amount of salts, such as in inland rivers and lakes.

gaining streams: streams that appear from the ground or cracks in rocks because they are flowing directly out of an aquifer.

gallon: a unit of liquid capacity equal to four quarts (about 3.8 liters).

glycerin: a sweet, thick liquid found in various oils and fats and can be used to moisten or dissolve something.

gill: an aquatic respiratory organ (as on fish) for obtaining oxygen dissolved in the water.

grade: the slope of the surface of the earth.

gradient: the degree of inclination, or the rate of ascent or descent, in a highway, road, river, etc.

gravity: the force of attraction, characterized by heaviness or weight, by which terrestrial bodies tend to fall toward the center of the earth.

green zones: areas along river- and streambanks, wetlands, lakes, and ponds where there is high productivity and diversity.

greywater: domestic wastewater that does not contain human wastes such as tub, shower, or washing machine water.

groundwater: water that infiltrates into the earth and is stored in usable amounts in the soil and rock below the earth's surface; water within the zone of saturation.

groundwater discharge: the flow or pumping of water from an aquifer.

groundwater recharge: the addition of water to an aquifer.

gully: a trench worn in the earth by running water.

habitat: the arrangement of food, water, shelter, and space suitable to animal's needs.

halite: a white or colorless mineral, sodium chloride or rock salt.

hardness: the amount of calcium carbonate dissolved in water.

hazardous chemicals: chemical compounds that are dangerous to human health and/or the environment.

hazardous waste: waste containing chemical compounds that are dangerous to human health and/or the environment.

heat capacity: the heat required to raise the temperature of a substance one Celcius degree.

heavy metals: metallic elements Example: cadmium, chromium, copper, lead, mercury, nickel, and zinc) which are used to manufacture products; they are present in some industrial, municipal, and urban runoff.

herbaceous: describes animals that are strictly plant-eating.

heterotroph: an organism that is not capable of making its own food.

holding pond: an animal waste treatment method which uses a shallow pond to temporarily store animal wastes for land application.

holding tanks: a container where wastewater is stored before it is removed for treatment; confined livestock operations have holding tanks to store animal wastes for land application at a later time.

humidity: the degree of wetness, especially of the atmosphere.

hydrocarbons: substances containing only hydrogen and carbon, such as methane, alkane, or ethylene.

hydroelectric: that generation of electricity which converts the energy of running water into electric power.

hydrogen sulfide gas (H₂S): a flammable, toxic, colorless gas with an offensive odor (similar to rotten eggs).

hydraulic: operated, moved, or brought about by means of water.

hydrologic (water) cycle: the cycle of the earth's water supply from the atmosphere to the earth and back which includes precipitation, transpiration, evaporation, runoff, infiltration, and storage in water bodies and groundwater.

hydropower: any means of harnessing power from water.

impermeable: impassable; not permitting the passage of a fluid through it.

impurity: something that, when mixed into something else, makes that mixture unclean or lowers the quality.

induced recharge: replenishing a water body or aquifer by transporting water from somewhere else and putting it into the water body or aquifer.

industrial pollution: pollution caused by industry.

infiltration: the gradual downward flow of water from the surface of the earth into the soil.

injection wells: a well in which fluids (such as wastewater, saltwater, natural gas, or used chemicals) are injected deep in the ground for the purpose of disposal or to force adjacent fluids like oil into the vicinity of oil producing wells.

inorganic material: material derived from nonorganic, or nonliving, sources.

inorganic nitrogen: nitrogen not derived from organic matter.

inorganic phosphorus: phosphorus not derived from organic matter.

irrigation: to supply (dry land) with water by means of ditches, pipes, or streams.

karst: a topography formed over limestone, dolomite, or gypsum and characterized by sinkholes, caves, and underground drainage.

lacustrine: refers to lake or river habitats.

lagoon: as a wastewater treatment method, an animal waste treatment method which uses a deep pond to treat manure and other runoff from a livestock operation, may be aerobic or anaerobic (both use bacteria to break down wastes).

landfill: a large, outdoor area for waste disposal; landfills where waste is exposed to the atmosphere (open dumps) are now illegal; in "sanitary" landfills, waste is layered and covered with soil.

landscaping: improving the natural beauty of a piece of land by planting or altering the contours of the ground.

land use: how a certain area of land is utilized (Examples: forestry, agriculture, urban, industry).

leachate: the liquid formed when water (from precipitation) soaks into and through a landfill, picking up a variety of suspended and dissolved materials from the waste.

leaching: the removal of chemical constituents from rocks and soil by water.

leaking underground storage tank (LUST): an underground container used to store gasoline, diesel fuel, home heating oil, or other chemicals that is damaged in some way and is leaking its contents into the ground; may contaminate groundwater.

legislation: a proposed or enacted law or group of laws.

limiting factor: a factor whose absence exerts influence upon a population and may be responsible for no growth, limited growth (decline), or rapid growth.

liner: a clay or plastic material placed between garbage and soil in a landfill to prevent rotting garbage from coming in contact with groundwater.

litter: rubbish discarded in the environment instead of in trash containers.

littoral zone: region in a body of water that sunlight penetrates.

longshore current: a current that moves parallel to the shore.

losing streams: streams which seem to disappear because they flow into an aquifer.

macroinvertebrates: organisms that are visible to the naked eye and lack a backbone.

mariculture: the cultivation of marine organisms in their natural habitats, usually for commercial purposes.

marine: of or relating to the sea.

marine intertidal: a coastal saltwater wetland flooded by tidewaters.

marine pollution: pollution found in the oceans, bays, or gulfs.

The Marine Protection, Research, and Sanctuaries Act of 1972 (Ocean Dumping Act): legislation regulating the dumping of any material in the ocean that may adversely affect human health, marine environments, or the economic potential of the ocean.

marsh: an area of low-lying wetland.

maximum contaminant levels: the highest content levels of certain substances allowable by law for a water source to be considered safe.

meander: to follow a winding course, such as a brook meandering through the fields.

membrane: a soft pliable sheet or layer, often of plant or animal origin.

mercury: a poisonous metallic element, Hg, atomic number 80, atomic weight 200.59, existing at room temperature as a silvery, dense liquid.

Mesopotamians: people from the ancient country of Mesopotamia located in southwest Asia between the Tigris and Euphrates rivers.

microbe: a microorganism; a very tiny and often harmful plant or animal.

microbial digestion: breakdown and use of a substance by microorganisms.

microbiology: the science and study of microorganisms, including protozoans, algae, fungi, bacteria, and viruses.

microorganisms: organisms too small to be seen with the unaided eye, including bacteria, protozoans, yeasts, viruses, and algae.

midnight dumping: a term used for illegal disposal of hazardous wastes in remote locations often at night, hence the term "midnight."

mill tailings: rock and other materials removed when minerals are mined; usually dumped onto the ground or deposited into ponds.

mineral: a naturally occurring substance (as diamond or quartz) that results from processes other than those of plants and animals; a naturally occurring substance (as ore, petroleum, natural gas, or water) obtained usually from the ground for human use.

miscible: capable of being mixed.

mixture: two or more substances mixed together in such a way that each remains unchanged (sand and sugar form a mixture).

moisture: a small amount of liquid that causes wetness.

molecules: the smallest portions of a substance having the properties of the substance.

monitoring: scrutinizing and checking systematically with a view to collecting data.

monofilament: a single large filament, or threadlike structure, of synthetic fiber, such as a monofilament fishing line.

mulch: a protective covering of various substances, especially organic; placed around plants to prevent evaporation of moisture and freezing of roots and to control weeds.

municipality: a political unit, such as a city or town, incorporated for local self-government.

municipal sewage: sewage originating from urban areas (not industrial).

National Environmental Policy Act of 1969 (NEPA): law that requires environmental impact statements be submitted for any major construction projects that uses U.S. federal money.

National Pollutant Discharge Elimination System (NPDES): part of the Clean Water Act requiring municipal and industrial wastewater treatment facilities to obtain permits which specify the types and amounts of pollutants that may be discharged into water bodies.

national water quality standards: maximum contaminant levels for a variety of chemicals, metals, and bacteria set by the Safe Drinking Water Act.

natural resource: something (as a mineral, forest, or kind of animal) that is found in nature and is valuable to humans.

negative charge: an electrical charge created by having more electrons than protons.

nitrates: used generically for materials containing this ion group made of nitrogen and oxygen (NO_3^-); sources include animal wastes and some fertilizers; can seep into groundwater; linked to human health problems, including "blue baby" syndrome (methemoglobinemia).

nitric acid (HNO_3): a component of acid rain; corrosive; damages buildings, vehicle surfaces, crops, forests, and aquatic life.

nonbiodegradable: materials that cannot be broken down by living things into simpler chemicals.

non-compliance: not obeying all the federal and state regulations that apply.

non-permeable surfaces: surfaces which will not allow water to penetrate, such as sidewalks and parking lots.

nonpoint source pollution (NPS): pollution that cannot be traced to a single point (Example: outlet or pipe) because it comes from many individual places or a widespread area (typically, urban, rural, and agricultural runoff).

nutrient: an element or compound, such as nitrogen, phosphorus, and potassium, that is necessary for plant growth.

offshore dumping: the disposal or dumping of waste material off or away from the shore.

The Oil Pollution Act: legislation that imposes substantial penalties and liability for oil spills in the ocean; violators are responsible for the cost of the cleanup and restoration of natural resources.

organic material: material derived from organic, or living, things; also, relating to or containing carbon compounds.

oil slick: a smooth area on the surface of water caused by the presence of oil.

organism: any living being; plants and animals.

oxygen depletion: the reduction of the dissolved oxygen level in a water body.

package plants: a small, semi-portable prefabricated wastewater treatment system that services an apartment complex, trailer park, camp, or self-contained business that is not connected to a city sewer system and is not on a site appropriate for a septic system.

palustrine aquatic beds: inland areas which contain floating or submerged aquatic vegetation.

palustrine emergents: plants growing in inland marshes and wet meadows.

palustrine forested: inland areas such as forested swamps or bogs.

palustrine shrub: inland wetland area with shrub growth.

palustrine unconsolidated bottom: muddy bottom of open water ponds.

percolate: to drain or seep through a porous substance.

permeable: passable; allowing fluid to penetrate or pass through it.

permeability: the property of a membrane or other material that permits a substance to pass through it.

pesticide: any chemical or biological agent that kills plant or animal pests; herbicides, insecticides, fungicides, rodenticides, etc. are all pesticides.

petroleum products: products derived from petroleum or natural gas.

pH: a measure of the concentration of hydrogen ions in a solution; the pH scale ranges from 0 to 14, where 7 is neutral and values less than 7 are acidic and values greater than 7 are basic or alkaline; pH is an inverted logarithmic scale so that every unit decrease in pH means a 10-fold increase in hydrogen ion concentration. Thus, a pH of 3 is 10 times as acidic as a pH of 4 and 100 times as acidic as a pH of 5.

phosphate: used generically for materials containing a phosphate group (PO_4^{3-}); sources include some fertilizers and detergents; when wastewater containing phosphates is discharged into surface waters, these chemicals act as nutrient pollutants (causing overgrowth of aquatic plants).

photodegradable: plastic that will decompose into smaller pieces under certain kinds of radiant energy, especially ultraviolet light.

plankton: minute animal and plant life in a body of water.

point source pollution: pollution that can be traced to a single point source, such as a pipe or culvert (Example: industrial and wastewater treatment plant, and certain storm water discharges).

polar: of or relating to the poles or ends of a magnet.

polarity: having a positive or negative charge.

pollutant: an impurity (contaminant) that causes an undesirable change in the physical, chemical, or biological characteristics of the air, water, or land that may be harmful to or affect the health, survival, or activities of humans or other living organisms.

pollution: contaminants in the air, water, or soil that cause harm to human health or the environment.

pollution prevention: preventing the creation of pollutants or reducing the amount created at the source of generation, as well as protecting natural resources through conservation or increased efficiency in the use of energy, water, or other materials.

pond: a body of water usually smaller than a lake.

population: the organisms inhabiting a particular area or biotope.

porosity: the property of being porous, having pores; the ratio of minute channels or open spaces (pores) to the volume of solid matter.

positive charge: an electrical charge created by having fewer electrons than protons.

potable: fit or suitable for drinking, as in potable water.

precipitation: water droplets or ice particles condensed from atmospheric water vapor and sufficiently massive to fall to the earth's surface, such as rain or snow.

primary treatment: the first process in wastewater treatment which removes settled or floating solids.

pristine: describes a landscape and/or a water body remaining in a pure state.

privy: an outhouse; a latrine.

protozoans: small single-cell microbes; frequently observed as actively moving organisms when impure water is viewed under a microscope; cause a number of widespread human illnesses, such as malaria, and thus can present a threat to public health.

pruning: trimming or cutting off undesired or unnecessary twigs, branches, or roots from a tree, bush, or plant.

purification: the process of making pure, free from anything that debases, pollutes, or contaminates.

quadrillion: the cardinal number represented by 1 followed by 15 zeros.

quota: the number or amount constituting a proportional share.

radioactive: having the property of releasing radiation.

radioactive pollution: the introduction of a radioactive material.

radon: a colorless, radioactive, inert gaseous element (atomic number 86) formed by the radioactive decay of radium; exposure to high levels causes cancer.

recharge: replenish a water body or an aquifer with water.

recharge areas: an area where water flows into the earth to resupply a water body or an aquifer.

reclaim: to return to original condition.

red tide: a reddish discoloration of coastal surface waters due to concentrations of certain toxin-producing algae.

reforestation: replanting trees and establishing a forest after forest harvesting or destruction.

regulation: a governmental order having the force of law.

renewable resource: a resource or substance, such as a forest, that can be replenished through natural or artificial means.

reservoir: a body of water collected and stored in a natural or artificial lake.

Resource Conservation and Recovery Act (RCRA): legislation passed in 1976 aimed at protecting the environment, including waterways, from solid waste contamination either directly, through spills, or indirectly, through groundwater contamination.

restoration: reestablishing the character of an area such as a wetland or forest; cleaning up a contaminated area according to specifications established by the U.S. Environmental Protection Agency.

reverse osmosis: a process where water is cleaned by forcing water through an ultra-fine semi-permeable membrane which allows only the water to pass through and retains the contaminants; these filters are sometimes used in tertiary treatment and to pretreat water in chemical laboratories.

ridge planting: a conservation farming method where seeds are planted in ridges which allows warmer soil temperatures and traps rainwater in the furrows between the ridges.

riparian area: the area along a waterway.

river: a large natural stream emptying into an ocean, lake, or other water body.

riprap: large rocks placed along the bank of a waterway to prevent erosion.

riverine habitats: tidal and non-tidal river systems that feed into wetlands.

The Rivers and Harbors Act of 1899: legislation regulating the discharge of refuse of any kind into navigable waters.

rough (scavenger) fish: non-sport species of fish that tolerate polluted water.

runoff: water (originating as precipitation) that flows across surfaces rather than soaking in; eventually enters a water body; may pick up and carry a variety of pollutants.

Safe Drinking Water Act: a regulatory program passed by the U.S. Congress in 1974 to help ensure safe drinking water in the United States; sets maximum contaminant levels for a variety of chemicals, metals, and bacteria in public water supplies.

saline intrusion: the saltwater infiltration of freshwater aquifers in coastal areas, when groundwater is withdrawn faster than it is being recharged.

salinity: an indication of the amount of salt dissolved in water.

salt marsh: an area where salt water from an ocean, bay, or gulf meets fresh water from a river.

salt water: water associated with the seas distinguished by high salinity.

sanitary landfill: rehabilitated land in which garbage and trash have been buried.

saturated air: air that contains as much moisture as it is possible to hold under existing conditions.

saturated zone: underground layer in which every available space is filled with water.

saturation: the state of being infused with so much of a substance (Example: water) that no more can be absorbed, dissolved, or retained.

secondary treatment: the wastewater process where bacteria are used to digest organic matter in the wastewater.

sediment: insoluble material suspended in water that consists mainly of particles derived from rocks, soil, and organic materials; a major nonpoint source pollutant to which other pollutants may attach.

sediment pollution: the introduction of sediment into a water body.

sediment pond: a natural or artificial pond for recovering the solids from effluent or runoff.

septic system: a domestic wastewater treatment system (consisting of a septic tank and a soil absorption system) into which wastes are piped directly from the home; bacteria decompose the waste, sludge settles to the bottom of the tank, and the treated effluent flows out into the ground through drainage pipes.

settling: the process of a substance, such as dregs or sediment, sinking or being deposited.

settling tank: a vessel in which solids settle out of water by gravity during drinking and wastewater treatment processes.

sewage contamination: the introduction of untreated sewage into a water body.

sewage outfall: the point of sewage discharge, often from a pipe into a body of water, in turn called the outfall area.

sewer system: an underground system of pipes used to carry off sewage and surface water runoff.

silage: livestock food prepared by storing and fermenting green forage plants in a silo.

silt: particles of small size left as sediment from water.

sinkhole: a natural depression in a land surface connected to a subterranean passage, generally occurring in limestone regions and formed by solution or by collapse of a cavern roof.

siphon: a bent pipe or tube through which liquid can be drawn by air pressure up and over the edge of a container; to draw off by a siphon.

slope: to take a slanting direction, such as a bank sloping down to a river; a piece of slanting ground, such as a hillside; the upward or downward slant, such as that of a roof.

slough: a stagnant swamp, marsh, bog, or pond, especially as a part of a bayou, inlet, or backwater.

sludge: solid matter that settles to the bottom of septic tanks or wastewater treatment plant sedimentation; must be disposed of by bacterial digestion or other methods or pumped out for land disposal or incineration.

solar radiation: radiation emitted by the sun.

solution: the result of solving a problem; a liquid in which something has been dissolved.

solvent: a liquid capable of dissolving another substance (Examples: paint thinner, mineral spirits, and water).

stormwater runoff: surface water runoff that flows into storm sewers or surface waters.

stream: a body of water flowing in a channel, as a brook, rivulet, or river.

stream use classification: a system for classifying streams according to the intended use of the water (Examples: recreation, industrial cooling, irrigation).

strip mine: an open mineral mine (Examples: coal, copper, zinc, etc.) where the topsoil and overburden is removed to expose and extract the mineral.

subsidence: the compacting and sinking of an area.

substance: a material of a particular kind or constitution.

substrate: the substance acted upon by an enzyme or a fermenter, such as yeast, mold, or bacteria.

suffocate: to die due to the lack of oxygen.

sulfuric acid: the acid (H_2SO_4) formed when sulfur oxides combine with atmospheric moisture; a major component of acid rain.

supersaturation: the state of being infused with more of a substance (Example: water) than is normally possible under given conditions of temperature and pressure.

surface tension: the elastic-like force in a body, especially a liquid, tending to minimize, or constrict, the area of the surface.

surface water: precipitation that does not soak into the ground or return to the atmosphere by evaporation or transpiration. It is stored in streams, lakes, rivers, ponds, wetlands, oceans, and reservoirs.

swamp: land having soils saturated with water for at least part of the year and supporting natural vegetation of mostly trees and shrubs.

taxa: one of the hierarchical categories into which organisms are classified.

temperate climates: climates that are neither hot nor cold; mild.

terrain: the characteristic features of a tract of land's surface; topography.

terrarium: a box, usually made of glass, that is used for keeping and observing small animals or plants.

thermal pollution: the increase in temperature of a body of water due to the discharge of water used as a coolant in industrial processes or power production; can cause serious damage to aquatic life.

TL (total length): the length of a fish from its mouth to the end of its tail.

toilet dam: a device that is placed inside the tank portion of a toilet to reduce the amount of water the tank will hold by partitioning off part of the tank.

topographic map: a map showing the relief features or surface configuration of an area, usually by means of contour lines.

topography: the detailed mapping or description of the features of a relatively small area, district, or locality; the relief features or surface configuration of an area.

topsoil: the rich upper layer of soil in which plants have most of their roots.

toxic: having the characteristic of causing death or damage to humans, animals, or plants; poisonous.

toxic chemical: a chemical with the potential of causing death or damage to humans, animals, or plants;

poison.

toxin: any of various poisonous substances produced by certain plant and animal cells, including bacterial toxins, phytotoxins, and zootoxins.

transpiration: direct transfer of water from the leaves of living plants or the skins of animals into the atmosphere.

treatment: a substance with which to treat water or a method of treating water to clean it.

treatment plant: facility for cleaning and treating fresh water for drinking, or cleaning and treating wastewater before discharging into a water body.

tributary: a stream or river that flows into a larger river or lake.

trough: the lowest point in a wave; also a channel for water; a long channel or hollow.

turbidity: the cloudy or muddy appearance of a naturally clear liquid caused by the suspension of particulate matter.

turbine: a device in which a bladed wheel is turned by the force of moving water or steam; connected by a shaft to a generator to produce electricity.

typhoid (fever): an acute, highly infectious disease caused by the typhoid bacillus, *Salmonella typhosa*, transmitted by contaminated food or water and characterized by bad rashes, high fever, bronchitis, and intestinal hemorrhaging.

ultraviolet light: similar to light produced by the sun; produced by special lamps. As organisms are exposed to this light, they are damaged or killed.

unconfined aquifer: an aquifer without a confining layer above it; the top surface of water in an unconfined aquifer is the water table.

underground storage tanks: large tanks buried underground for storing liquids (Examples: gasoline, heating oil); potential source of groundwater contamination if the tanks leak.

unit: a fixed quantity (as of length, time, or value) used as a standard of measurement; a single thing, person, or group forming part of a whole.

unsaturated zone: an area underground between the ground surface and the water table where the pore spaces are not filled with water, also known as the zone of aeration.

upstream: toward the source of a stream or current.

urban area: an area that is highly populated, such as a city or town.

wastewater: water that has been used for domestic or industrial purposes.

wastewater treatment: physical, chemical, and biological processes used to remove pollutants from wastewater before discharging it into a water body.

waterborne disease: a disease spread by contaminated water.

water conservation: practices which reduce water use.

water cycle: see hydrologic cycle.

water pollution: the act of making water impure or the state of water being impure.

water quality: the condition of water with respect to the amount of impurities in it.

watershed: land area from which water drains to a particular water body.

water system: a river and all its branches.

water table: the upper surface of the zone of saturation of groundwater.